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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,642	01/03/2002	Hong Kui Yang	01-766 72202 (6653)	9246

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EXAMINER	
CHOW, CHARLES CHIANG	
ART UNIT	**PAPER NUMBER**
2685	4

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/033,642	YANG ET AL.	
	Examiner	Art Unit	
	Charles Chow	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Detailed Action

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 6, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aschwanden (US 5,896,306) in view of Peterzell (US 2002/0123,319 A1).

Regarding **claim 1**, Aschwanden teaches a direct conversion receiver DCR (Fig. 1) comprising a pair of quadrature conversion path (channel A, channel B in Fig. 1) each of said quadrature conversion paths receiving an RF input signal (the signal from antenna to RF processor) and converting said RF signal to a digital base band signal (the converted base band signal is of 2.86 MHz wide for low-pass-filter LPF having cut off of 2.86 MHz in col. 3, line 57 to col. 4, line 4; the base band signal to I-processor, Q-processor in Fig. 1, col. 6, lines 7-11), each quadrature comprising a mixer mixing RF input signal with a carrier phase signal (mixer MA, MB, mixing rf signal from rf processor with carrier phase signals $sinw_0$, $consw_0$, in Fig. 1), an analog filter receiving a quadrature base band signal from said multiplied and providing a filtered base band signal (the LPF-A, LPF-B in Fig. 1 for providing filtered base band signal with cut off of 2,86 MHz having sharp stop band attenuation, col. 3, lines 57 to col. 4, lines 4; col. 2, line 62 to col. 3, line 7), an analog-to-digital converter ADC converting a quadrature baseband component to a digital band signal (the analog to digital converter ADC-A, ADC-B, converts signal from low pass filter LPF-A,

LPF-B, to data stream, col. 3, lines 30-34), a phase equalizer compensating for phase distortion arising in the analog filter (the phase corrector-A, phase corrector-B, cancels the distorted phase response of the group delay of the low pass filter LPF-A/LPF-B, due to the sharp cut off of the frequency response of the low pass filter LPF, col. 3, lines 34-45; col. 3, lines 7-23), the base band processor receive quadrature digital base band outputs from the pair of quadrature conversion paths and providing information therefrom (the I-processor, Q-processor for receiving corrected in-phase I, quadrature phase Q base band signal for providing demodulated data, Fig. 1). Aschwanden fails to teach a 5th order elliptical filter filtering said quadrature base band component. However, Peterzell teaches the 5th order elliptic filter filtering said quadrature base band component (IIR filter 910 is a fifth order digital filter for rejecting jammers in the digital base band signal, Fig. 8, [0089]) of the direct conversion receiver 800 (Fig. 8, abstract, [0002, 0037]). Peterzell teaches an improved technique for reducing the jammer interference [0033-0037] by including the 5th order elliptic filter. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Aschwanden with Peterzell's 5th elliptical filter, such that the interference signal could be reduced.

Regarding **claim 6,** Aschwanden teaches a direct conversion receiver DCR (Fig. 1) comprising a pair of quadrature conversion path (channel A, channel B in Fig. 1) each of said quadrature conversion paths receiving an RF input signal (the signal from antenna to RF processor) and converting said RF signal to a digital base band signal (the converted base band signal is of 2.86 MHz wide for low-pass-filter LPF having cut off of 2.86 MHz in col. 3, line 57 to col. 4, line 4; the base band signal to I-processor, Q-processor in Fig. 1, col. 6,

lines 7-11), each quadrature comprising a mixer mixing RF input signal with a carrier phase signal (mixer MA, MB, mixing rf signal from rf processor with carrier phase signals $sinw_o$, $consw_o$, in Fig. 1), an analog filter receiving a quadrature base band signal from said multiplied and providing a filtered base band signal (the LPF-A, LPF-B in Fig. 1 for providing filtered base band signal with cut off of 2,86 MHz having sharp stop band attenuation, col. 3, lines 57 to col. 4, lines 4; col. 2, line 62 to col. 3, line 7), an analog-to-digital converter ADC converting a quadrature baseband component to a digital band signal (the analog to digital converter ADC-A, ADC-B, converts signal from low pass filter LPF-A, LPF-B, to data stream, col. 3, lines 30-34), a phase equalizer compensating for phase distortion arising in the analog filter (the phase corrector-A, phase corrector-B, cancels the distorted phase response of the group delay of the low pass filter LPF-A/LPF-B, due to the sharp cut off of the frequency response of the low pass filter LPF, col. 3, lines 34-45; col. 3, lines 7-23), the base band processor receive quadrature digital base band outputs from the pair of quadrature conversion paths and providing information therefrom (the I-processor, Q-processor for receiving corrected in-phase I, quadrature phase Q base band signal for providing demodulated data, Fig. 1). Aschwanden fails to teach a 5th order elliptical filter receiving said quadrature base band component and providing a filtered digital base band component. However, Peterzell teaches the a 5th order elliptical filter receiving said quadrature base band component and providing a filtered digital base band component (IIR filter 910 is a fifth order digital filter for rejecting jammers in the digital base band signal, Fig. 8, [0089]) of the direct conversion receiver 800 (Fig. 8, abstract, [0002, 0037]). Peterzell teaches an improved technique for reducing the jammer interference [0033-0037] by

including the 5th order elliptic filter. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Aschwanden with Peterzell's 5th elliptical filter, such that the interference signal could be reduced.

Regarding **claim 9**, Aschwanden teaches a direct conversion receiver DCR (Fig. 1) comprising a pair of quadrature conversion path (channel A, channel B in Fig. 1) each of said quadrature conversion paths receiving an RF input signal (the signal from antenna to RF processor) and converting said RF signal to a digital base band signal (the converted base band signal is of 2.86 MHz wide for low-pass-filter LPF having cut off of 2.86 MHz in col. 3, line 57 to col. 4, line 4; the base band signal to I-processor, Q-processor in Fig. 1, col. 6, lines 7-11), each quadrature comprising a mixer mixing RF input signal with a carrier phase signal (mixer MA, MB, mixing rf signal from rf processor with carrier phase signals $sinw_o$, $consw_o$, in Fig. 1), an analog filter receiving a quadrature base band signal from said multiplied and providing a filtered base band signal (the LPF-A, LPF-B in Fig. 1 for providing filtered base band signal with cut off of 2,86 MHz having sharp stop band attenuation, col. 3, lines 57 to col. 4, lines 4; col. 2, line 62 to col. 3, line 7), an analog-to-digital converter ADC converting a quadrature baseband component to a digital band signal (the analog to digital converter ADC-A, ADC-B, converts signal from low pass filter LPF-A, LPF-B, to data stream, col. 3, lines 30-34), a phase equalizer compensating for phase distortion arising in the analog filter (the phase corrector-A, phase corrector-B, cancels the distorted phase response of the group delay of the low pass filter LPF-A/LPF-B, due to the sharp cut off of the frequency response of the low pass filter LPF, col. 3, lines 34-45; col. 3, lines 7-23), the base band processor receive quadrature digital base band outputs from the

pair of quadrature conversion paths and providing information therefrom (the I-processor, Q-processor for receiving corrected in-phase I, quadrature phase Q base band signal for providing demodulated data, Fig. 1). Aschwanden fails to teach a 5th order elliptical filter filtering said quadrature base band signal and providing a quadrature base band component. However, Peterzell teaches a 5th order elliptical filter filtering said quadrature base band signal and providing a quadrature base band component (IIR filter 910 is a fifth order elliptic digital filter for rejecting jammers in the digital base band signal, Fig. 8, [0089]) of the direct conversion receiver 800 (Fig. 8, abstract, [0002, 0037]). Peterzell teaches an improved technique for reducing the jammer interference [0033-0037] by including the 5th order elliptic filter. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Aschwanden with Peterzell's 5th elliptical filter, such that the interference signal could be reduced.

2. Claims 2-5, 7-8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aschwanden in view of Peterzell, as applied to claim 1 above, and further in view of Choi et al. (US 2003/0214,926 A1).

Regarding **claim 2**, Aschwanden and Peterzell fail to teach the second order all pass digital phase equalizer. Choi teaches the phase equalizer 205 having the second order all pass transfer function in equation (1) to equation (4), for the all pass digital phase equalizer [0079-0086]. Choi teaches an improved technique for reducing interference from other mobile station's pilot signal, by utilizing digital phase equalizer [0014-0018]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify

Aschwanden, Peterzell, with Choi's second order all pass digital phase equalizer, such that the interference from other mobile station could be reduced.

Regarding **claims 3,8, 11**, Choi taught the phase equalizer has transfer function defined by equation (4) in [0084-0085].

Regarding **claim 4**, Peterzell taught each 5th order elliptical filter receives the digital output of the ADC and provides said digital base band component to the phase equalizer (the ADC 880 is connected to IIR filter 910 which is a fifth order elliptic digital filter for rejecting jammers in the digital base band signal, Fig. 8, [0089]).

Regarding **claim 5**, Aschwanden taught each 5th order elliptical filter receives the filtered base band signal from the analog filter (LPF A, LPF B, are seven-pole elliptical LC filters, col. 3, line 57 to col. 4, line 4) and provides the quadrature base band component to the ADC (LPF A, LPF B, is connected respectively to ADC-A, ADC-B), the ADC output being provided to the phase equalizer (the phase correction A, phase corrction B, Fig. 1).

Regarding **claims 7, 10**, Choi taught the second order all pass digital phase equalizer (the phase equalizer 205 having the second order all pass transfer function in equation (1) to equation (4), for the all pass digital phase equalizer [0079-0086]).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. US (5,828,955) Lipowski et al. teaches a near direct conversion receiver having the DPS 40 for adjusting, correcting, amplitude, phase error by equalizing the amplitude, phase of the quadrature signal (Fig. 2, abstract).

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (703)-306-5615.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)-305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Charles Chow C. C.

August 2, 2004.